

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Claim 1 (Original): A quantum well infrared photodetector (QWIP) device comprising:
an emitter contact layer;
a stack including a number of quantum wells, each well sandwiched between barrier layers; and
an electron launcher configured with a plurality of steps to enable dark electrons to move rapidly from the emitter contact layer into the stack, thereby reducing dielectric relaxation effect.

Claim 2 (Original): The device of claim 1 wherein a first barrier in the stack is defined by a particular semiconductor material make-up, and each step of the electron launcher adds about 25% or less of that first barrier's make-up.

Claim 3 (Original): The device of claim 1 wherein the device is configured as an indirect-gap type structure, and the quantum wells are GaAs and the barriers are AlGaAs.

Claim 4 (Original): The device of claim 1 wherein the device is configured as a strained type structure, and the quantum wells are InGaAs, and the barriers are AlGaAs.

Claim 5 (Original): The device of claim 1 wherein the quantum wells have a width of about 40 Å to 80 Å, and the barriers have a thickness of about 500 Å or more.

Claim 6 (Original): The device of claim 1 wherein the device further includes a collector contact layer that is proximate to a last barrier included in the stack.

Claim 7 (Original): The device of claim 6 wherein the device further includes a second electron launcher configured with a plurality of steps to enable dark electrons to rapidly move from the collector contact layer into the stack, thereby reducing dielectric relaxation effect during reverse bias applications.

Claims 8 (Original): The device of claim 6 wherein the device further includes a blocking layer between the stack and the collector contact layer for suppressing tunneling current from the quantum wells.

Claim 9-15 (Canceled).

Claim 16 (Original): A quantum well infrared photodetector (QWIP) device comprising:
a stack including a number of quantum wells, each well sandwiched between barrier layers; and
an electron launcher configured with a plurality of steps to enable dark electrons to move rapidly from a contact layer into the stack, thereby reducing dielectric relaxation effect.

Claim 17 (Original): The device of claim 16 wherein a first barrier in the stack is defined by a particular semiconductor material make-up, and each step of the electron launcher adds about 25% or less of that first barrier's make-up.

Claim 18 (Original): The device of claim 16 wherein the device further includes a blocking layer that is proximate to an end barrier of the stack for suppressing tunneling current from the quantum wells.

Claim 19 (Original): The device of claim 16 wherein the stack is configured to detect multiple wavelengths.

Claim 20 (Original): The device of claim 16 wherein the device further comprises:
an emitter contact layer that is proximate to a first end barrier of the stack; and
a collector contact layer that is proximate to a second end barrier of the stack.